Standardized Infection Ratio (SIR) Table

Device-Associated Infections

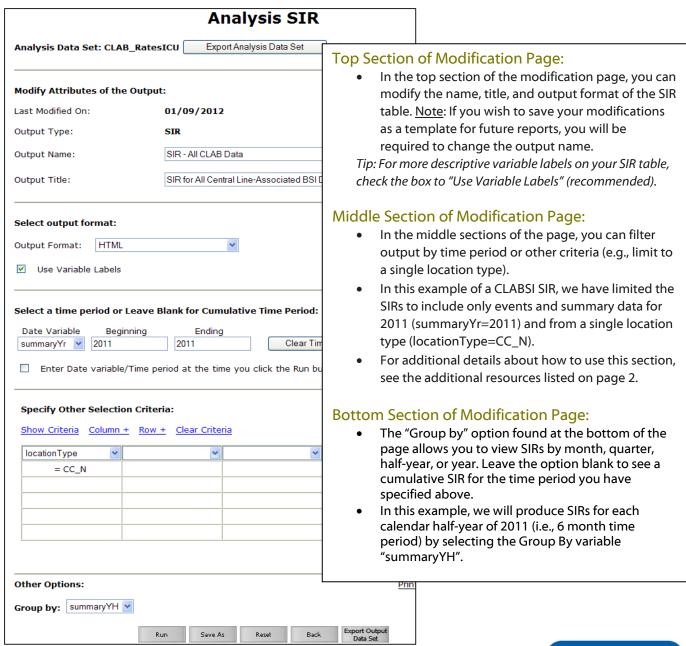
Description

The standardized infection ratio is a risk-adjusted summary measure that compares the observed number of infections to the expected number of infections based on NHSN aggregate data. This document explains how to calculate and interpret the SIR for device-associated infections. The example below is for CLABSI, but the CAUTI SIR is calculated and interpreted in a similar manner.

Example

Below is an example of an SIR table for CLABSI surveillance that occurred in neonatal critical care locations in 2011 grouped by half-year (6-month, calendar half-year).

Modification Page



Output/Results and Interpretation

National Healthcare Safety Network

SIR for All Central Line-Associated BSI Data - By OrgID

As of: February 29, 2012 at 10:44 AM

Date Range: CLAB_RATESALL summaryYr 2011 to 2011

if (((locationType = "CC_N")))

Org ID	Summary Yr/Half	infCount	Number Expected	Central Line Days	SIR	SIR p-value	95% Confidence Interval
10018	2011H1	1	1.356	571	0.737	0.6071	0.019, 4.109
10018	2011H2	0	0.070	30			

If infCount in this table is less than you reported, aggregate data are not available to calculate numExp.

Lower bound of 95% Confidence Interval only calculated if infCount > 0. SIR values only calculated if numExp >= 1.

SIR excludes those months and locations where device days are missing.

Source of aggregate data: NHSN Report, Am J Infect Control 2009;37:783-805 Data contained in this report were last generated on January 9, 2012 at 3:41 PM.

- This facility reported 1 central line-associated BSI (infCount) in the neonatal critical care location (locationType="CC-N") during the first half of 2011. This is the observed number of CLABSIs.
- For each time period, the number of expected (or predicted) CLABSIs ("Number Expected") is calculated by
 multiplying each location's number of central line days by the NHSN pooled mean and dividing by 1000. The
 number expected for each location is then summed to result in the overall number expected.
- The SIR is the number of observed CLABSIs (numerator) divided by the number of expected CLABSIs (denominator); in this example, 1/1.356 = 0.737. An SIR will only be calculated if the number of expected infections is ≥ 1. When the expected number of infections is <1, it is considered too low to calculate a precise SIR and comparative statistics. Note that this is the case for the second half of 2011 in our example. When this occurs, you may wish to group your SIRs by a longer time period, such as calendar year (summaryYr).
- The SIR p-value is a statistical measure that tells you if the observed number of infections is significantly different from what was expected. A p-value less than 0.05 (an arbitrary and conveniently used cut point) indicates that the number of observed CLABSIs is statistically significantly different (higher or lower) from the number expected. In this example, the p-value for the first half of 2011 is greater than 0.05 and thus there is no significant difference between the number of infections observed and the number of infections expected.
- The 95% Confidence Interval is a range of values in which the true SIR is thought to lie, however the SIR reported under the SIR column is the most likely value. If the confidence interval includes the value of 1 (as in this example), then the SIR is not significant (the number of observed infections is not significantly different from the number expected, using the same convenient cut point). The statistical evidence should be interpreted as insufficient to conclude that the SIR is different than 1.

Additional Resources:

Introduction to NHSN Analysis: http://www.cdc.gov/nhsn/PDFs/training/intro-AnalysisBasics-PSC.pdf
How to filter your data by time period: http://www.cdc.gov/nhsn/PS-Analysis-resources/PDF/FilterTimePeriod.pdf
How to filter your data on additional criteria: http://www.cdc.gov/nhsn/PS-Analysis-resources/PDF/SelectionCriteria.pdf
NHSN Newsletter: Your Guide to the Standardized Infection Ratio:

http://www.cdc.gov/nhsn/PDFs/Newsletters/NHSN_NL_OCT_2010SE_final.pdf